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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/662,945
Filing Date: September 15, 2003
Appellant(s): PAPALLO ET AL.

Paul D. Greeley
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on June 29, 2007 and Supplement to the Appeal Brief filed on August 30, 2007 appealing from the Office action mailed July 14, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,568,399	SUMIC	10-1996
6,728,205	FINN et al.	4-2004
2005/0251296	TRACY NELSON et al.	11-2005

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

DETAILED ACTION

Final Rejection

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-4, 6-11, 29-37, 39-46, 49, 51-58, 60, 62-69 and 71 are rejected under 35 U.S.C. 102(b) as being anticipated by **Sumic (5,568,399)**.

Regarding claim 1, **Sumic** discloses a method of protecting a circuit comprising: monitoring a zone of protection of the circuit to determine a first topology (Col. 5, lines 59-66; Col. 6, lines 6-30; Figs. 3a-3b); adjusting a zone protective function for said zone of protection based at least in part upon changes to said first topology (Col. 6, lines 58-61, i.e., the protective device schema data structure is dynamically maintained and updated following any changes to the distribution system functional topology during the operation of the power distribution system), said zone protective function detecting a fault in said zone of protection (Col. 5, lines 59-67; Col. 7, lines 25-39); and performing said zone protective function on said zone of protection to detect said fault (Col. 6, lines 41-49; Col. 5, lines 59-67; Col. 7, lines 40-43);

As for claims 29, 39, 51 and 62, **Sumic** further discloses,

29. A protection system for coupling to a circuit having a circuit breaker (Col. 5, lines 17-18), the system comprising: a control processing unit being communicatively coupleable to the circuit (Fig. 2, element 42), so that said control processing unit can monitor a topology of the circuit (Fig. 5A, steps 72, 74), said control processing unit defining a zone of protection for at least a portion of the circuit based at least in part upon said topology (Col. 5, lines 59-66), and said control processing unit redefining said zone of

protection based at least in part upon changes to said topology (Col. 6, lines 58-61, i.e., the protective device schema data structure is dynamically maintained and updated following any changes to the distribution system functional topology during the operation of the power distribution system), wherein said control processing unit adjust a zone protective function for said zone of protection based at least in part upon changes to said topology (Col. 6, lines 58-61, i.e., the protective device schema data structure is dynamically maintained and updated following any changes to the distribution system functional topology during the operation of the power distribution system), said zone protective function detecting a fault in said zone of protection (Col. 5, lines 59-67; Col. 7, lines 25-39).

39. A protection system for coupling to a circuit having a zone of protection and a circuit breaker (Col. 5, lines 17-18), the system comprising: a control processing unit being communicatively coupleable to the circuit so that said control processing unit can monitor a topology of the zone of protection (Fig. 2, element 42), said control processing unit adjusting a zone protective function for the zone of protection based at least in part upon said topology (Col. 6, lines 44-61; Col. 6, lines 19-23), and said control processing unit performing said zone protective function to detect a fault in the zone of protection (Col. 5, lines 59-67).

51. A power distribution system comprising: a circuit (Fig 3a); and a control processing unit communicatively coupled to said circuit (Fig. 2, element 42; Col. 5, lines 47-66), wherein said control processing unit determines a topology of said circuit (Col. 5, lines

59-66; Col. 6, lines 6-30; Figs. 3a-3b), wherein said control processing unit defines a zone of protection for at least a portion of said circuit based at least in part upon said topology (Col. 5, lines 59-66), and wherein said control processing unit redefines said zone of protection based at least in part upon changes to said topology (Col. 6, lines 58-61), and wherein said control processing unit adjust a zone protective function for said zone of protection based at least in part upon changes to said topology (Col. 6, lines 58-61, i.e., the protective device schema data structure is dynamically maintained and updated following any changes to the distribution system functional topology during the operation of the power distribution system), said zone protective function detecting a fault in said zone of protection (Col. 5, lines 59-67; Col. 7, lines 25-39).

62. A power distribution system comprising: a circuit having a zone of protection (Figs 4A –4B); and a control processing unit being communicatively coupled to said circuit (Fig. 2, element 42; Col. 5, lines 47-66), wherein said control processing unit monitors a topology of said zone of protection (Fig. 5A, steps 72, 74), wherein said control processing unit adjusts a zone protective function for said zone of protection based at least in part upon said topology (Col. 6, lines 44-61; Col. 6, lines 19-23), and wherein said control processing unit performs said zone protective function to detect a fault in said zone of protection (Col. 5, lines 59-67).

As for claims 3-4, **Sumic** discloses,

3. The method of claim 1, further comprising determining said first topology based at least in part upon a state for each of a plurality of power switching devices in said zone of protection, said state being either opened or closed (Col. 5, lines 30-34, status of the power grid; Col. 6, lines 1-6, i.e., the distribution system topology used in the outage determination program describes the function topology or *connectivity* of the power distribution grid).

4. The method of claim 3, further comprising opening at least one of said plurality of power switching devices in said zone of protection based at least in part upon said zone protective function (Col. 5, lines 23-26).

As for claims 6-11, **Sumic** discloses,

6. The method of claim 3, further comprising: monitoring electrical parameters of said zone of protection; and communicating said electrical parameters over a network to a microprocessor (Col. 7, lines 4-13).

7. The method of claim 6, wherein said microprocessor applies an algorithm to said electrical parameters to perform said zone protective function (Figs. 5A-5B).

8. The method of claim 7, wherein said microprocessor uses a coefficient of said algorithm in applying said zone protective function, and wherein said microprocessor adjusts said coefficient based at least in part upon said changes to said first topology

(Col. 10, lines 9-47).

9. The method of claim 6, wherein said microprocessor is configured to operate each of said plurality of power switching devices in said zone of protection (Col. 9, lines 35-55).

10. The method of claim 6, further comprising generating an open command by said microprocessor in response to said electrical parameters, communicating said open command from said microprocessor to an actuator operably connected to at least one of said plurality of power switching devices, and opening said at least one of said plurality of power switching devices in response to said open command (Col. 5, lines 23-28).

11. The method of claim 6, further comprising sensing said electrical parameters with a sensor, communicating signals representative of said electrical parameters to a module, and communicating said signals to said microprocessor, wherein said module, said sensor and said microprocessor are communicatively coupled (Col. 7, lines 4-13).

As for claims 30-32, **Sumic** discloses,

30. The system of claim 29, further comprising a network in communication with said control processing unit and the circuit (Fig. 2; Col. 5, lines 47-66).

31. The system of claim 29, wherein said control processing unit operatively controls the

circuit breaker (Col. 5, lines 23-28).

32. The system of claim 31, wherein said control processing unit receives parameter signals representative of electrical parameters of the circuit Col. 7, lines 4-13), and wherein said control processing unit opens the circuit breaker in response to said parameter signals if a fault is detected in the circuit (Col. 5, lines 23-28).

As for claims 33-34, the same citations applied to claims 7-8 above apply as well for these claims.

As for claim 35, **Sumic** discloses,

35. The system of claim 32, wherein said electrical parameters further comprise a state of the circuit breaker, said state being either opened or closed, and wherein said topology is monitored by said control processing unit based at least in part upon said state of the circuit breaker (Col. 5, lines 23-29 and lines 59-66).

As for claims 36-37, 46, 49, 58, 69, and 71 the same citations applied to claims 10-11 above apply as well for these claims.

As for claims 40-42, 52-55, and 63-65, the same citations applied to claims 30-32 above apply as well for these claims.

As for claims 43-44, 57, 60, and 66-67, the same citations applied to claims 7-8 above apply as well for these claims.

As for claim 45, 56, and 68, the same citations applied to claim 35 above apply as well for these claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 5, 14, 16, 19-26, 38, 50, 59, 61, 70 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sumic (5,568,399)** in view of **Finn et al. (US 6,728,205 B1).**

Sumic discloses the limitations of claims 1, 51, and 62, and further discloses:

Regarding claim 14,

14. A method of protecting a circuit comprising: monitoring the circuit to determine a first topology (Col. 5, lines 59-66; Col. 6, lines 6-30; Figs. 3a-3b); and defining a zone of protection for at least a portion of the circuit based at least in part upon changes to said first topology (Col. 6, lines 58-61, i.e., the protective device schema data structure is dynamically maintained and updated following any changes to the distribution system functional topology during the operation of the power distribution system); performing a zone protective function on said zone of protection to detect a fault; Col. 6, lines 19-23).

As for claim 16, **Sumic** discloses,

As for claim 16, the same citations applied to claim 4 above apply as well for this claim (see also Col. 6, line 62 6o Col. 7, line 13; Col. 5, lines 59-67).

As for claim 19, **Sumic** discloses,

19. The method of claim 17, further comprising: determining said first topology based upon a state for each of a plurality of power switching devices in the circuit, said state being either opened or closed; and opening at least one of said plurality of power switching devices based at least in part upon said zone protective function (Col. 6, line 62 to Col. 7, line 13; Col. 5, lines 59-67).

As for claims 21-26, the same citations applied to claims 6-11 above apply as well for these claims.

However, **Sumic** does not disclose some limitations of claim 14 and the limitations of claims 2, 5, 20, 38, 50, 59, 61, 70 and 74. But **Finn** discloses such limitations as follows:

As for claim 2,

2. The method of claim 1, further comprising: determining a second topology of the circuit based at least in part upon a state for each of a plurality of power switching devices in the circuit, said state being either opened or closed (Fig. 8, step 194, i.e.

Generate more subgraphs? , please note that each subgraph corresponds to a portion of a topology of the circuit; Col. 1, lines 44-49, please note that when link or node in a path fails communication is disrupted corresponds to an open state; and defining said zone of protection based at least in part upon said second topology (Fig. 10, Define reverse subgraph; Fig. 8, step 198, Generate a next subgraph from the remaining network; Col. 18, lines 43-52; Col. 18, lines 55-66).

As for claims 5, 20, 38, 50, 59 and 70, **Finn** discloses

determining a dynamic delay time for opening said at least one of said plurality of power switching devices in said zone of protection; and opening said at least one of said plurality of power switching devices in said zone of protection after said dynamic delay time has elapsed Col. 2, lines 58-61; Col. 3, lines 29-34).

As for claim 14,

14. monitoring a second topology for said zone of protection; and adjusting said zone protection function based at least in part upon changes to said second topology (Fig. 2, each tree corresponds to a topology; Col. 22, lines 54 to Col. 23, lines 27).

As for claims 61 and 74, **Finn** further discloses,

61. The system of claim 51, wherein said circuit comprises a first circuit breaker and a second circuit breaker, said first circuit breaker being downstream of said second circuit breaker , said first circuit breaker having a first current running therethrough and first

pickup settings, wherein said control processing unit causes said second circuit breaker to enter a pickup mode as a function of said first current and said first pickup settings when a fault is detected downstream of said first circuit breaker (Figs. 4-4B, Col 22, lines 54-67; Col. 15, lines 57- Col. 16, line 11; please note that any node corresponds to a circuit breaker and when a fault is detected between nodes 1 and 2 then node 8 enters a pickup mode as shown in Fig. 4A)..

Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of **Sumic** with the automatic protection switching system of **Finn** because it would provide an improved system for generating subgraphs on node and edge redundant networks having an arbitrary network topology when a fault is detected (Abstract; Col. 1, lines 15-20; Col. 6, lines 38-44).

3. Claims 12-13, 47-48 and 72-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sumic (5,568,399)** in view of **Tracy Nelson et al. (US 2005/0251296 A1).**

Sumic discloses the limitations of claims 1, 3, 6, 11, 14, 15, 17, 19, 21, 26, 39, 41, 42, 46, 62, 65, and 71. **Sumic** further discloses adjusting said zone protective functions based upon changes in said topology (See citations of Claim 1). However, **Sumic** does not disclose the limitations of claims 12-13, 47-48 and 72-73, but **Tracy** discloses such limitations as follows:

monitoring said sensor to detect an error in sensing said electrical parameters; and adjusting said zone protective function based at least in part upon the detection of said error ([0082], time stamps errors; [0126]);

monitoring said module to detect an error in communicating said signals to said microprocessor; and adjusting said zone protective function based at least in part upon the detection of said error ([0080]-[0081], integrity check; [0087]; [0107]; [0126]).

Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of **Sumic** with the method and apparatus for control of an electric power distribution system in response to circuit abnormalities of **Tracy** because it would provide a more efficiently and flexible system to respond to abnormalities to reconfigure and restore service to end customers by including error checking in the system as taught by Tracy (Abstract; [0081-[0087]).

4. Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sumic (5,568,399)** and **Finn et al. (US 6,728,205 B1)** and further in view of **Tracy Nelson et al. (US 2005/0251296 A1).**

As for claims 27-28, **Sumic** and **Finn** disclose the limitations of claims 14, 19, 21, 26 above. **Sumic** further discloses adjusting said zone protective functions based upon changes in said topology (See citations of Claim 1). However, **Sumic** and **Finn** does not disclose the limitations of claims 27-28, but **Tracy** discloses such limitations as follows:

monitoring said sensor to detect an error in sensing said electrical parameters; and adjusting said zone protective function based at least in part upon the detection of said error ([0082], time stamps errors; [0126]);

monitoring said module to detect an error in communicating said signals to said microprocessor; and adjusting said zone protective function based at least in part upon the detection of said error ([0080]-[0081], integrity check; [0087]; [0107]; [0126]).

Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of **Sumic** and **Finn** with the method and apparatus for control of an electric power distribution system in response to circuit abnormalities of **Tracy** because it would provide a more efficiently and flexible system to respond to abnormalities to reconfigure and restore service to end customers by including error checking in the system as taught by Tracy (Abstract; [0081-[0087]).

(10) Response to Argument

Regarding independent claim 1, Appellants set forth two arguments on Pages 6-21 of the brief: Sumic does not disclose or suggest adjusting the zone protective function itself, which is an adjustment of how the protective devices operate. Appellant further argues, Sumic simply fails to disclose or suggest adjusting the zone protective function itself based at least in part upon changes to said first topology. These arguments will be addressed below in order.

The appellant argues on Page 6 of the brief that Sumic does not disclose or suggest adjusting the zone protective function itself, which is an adjustment of how the protective devices operate.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., itself, which is an adjustment of how the protective devices operate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, Sumic discloses (as recited in claim 1) adjusting the zone protective function based at least in part upon changes to said first topology (Col. 6, lines 58-61, i.e., the protective device schema data structure is dynamically maintained and *updated* following any *changes* to the distribution *system functional topology* during the operation of the power distribution system; Col. 5, lines 59-67; Col. 7, lines 25-39). Please note that Sumic discloses that "the present invention determine the location of protective devices that possibly operated due to faults in the power distribution grid using distribution system information, such as distribution system topology and protective device schema. This information, in turn, is used to isolate the probable cause of the power outage". There is an adjustment to the topology when isolating a portion of the system.

Appellants argue that adjusting the order or schema in which the protective devices operate is not the same as adjusting the zone protective function. Examiner disagrees because by adjusting the order or schema or layout or *topology* of the protective devices, the zone protective function is adjusted. As shown in Figs. 4A-4B, if there is a fault then the topology of the circuit would be adjusted because P6 would be the back up for P7 and P3 would be the back up for P6 and so on. In that manner only a minimal portion of the circuit would be affected by the fault. Therefore, the topology or layout of the circuit is adjusted when isolating a portion of the system.

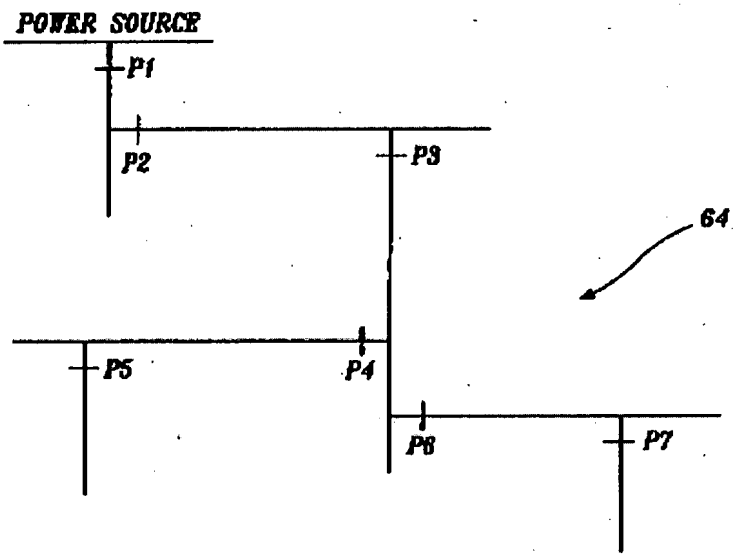


Fig. 4A.

PROTECTIVE DEVICE	BACKUP PROTECTIVE DEVICE
P7	P6
P6	P3
P3	P2
P2	P1
P4	P3
P5	P4

66

Fig. 4B.

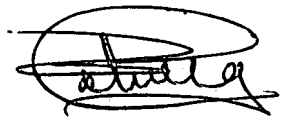
Regarding independent claims 14, 29, 39, 51 and 62 the same arguments applied to claim 1 above apply as well for these claims.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



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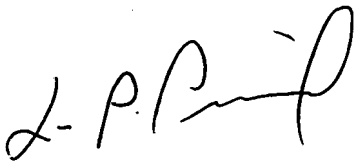

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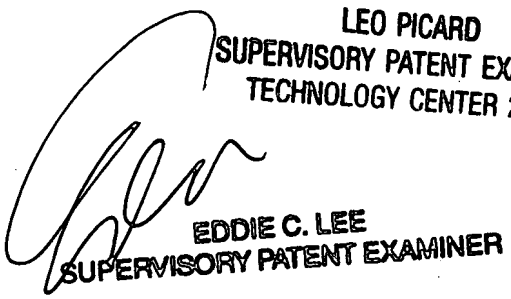

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